

Four New Species of *Oxytropis* DC. (Leguminosae) from Xinjiang, China

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Four new species of *Oxytropis* subgenus *Oxytropis* are described from Xinjiang, China: *O. barkolensis* X.Y.Zhu, H.Ohashi & Y.B.Deng, *O. qitaiensis* X.Y.Zhu, H.Ohashi & Y.B.Deng, *O. tukemansuensis* X.Y.Zhu, H.Ohashi & Y.B.Deng, and *O. yekenensis* X.Y.Zhu, H.Ohashi & Y.B.Deng.

Key words: China, Leguminosae, new species, *Oxytropis*, Xinjiang

Oxytropis, a genus belonging to tribe Galegeae of Papilionoideae in Leguminosae, contains about 300 species occurring in cold mountainous regions of Europe, Asia and North America, and is most numerous in Central Asia (Polhill 1981). The genus was established by De Candolle (1802) who distinguished it from *Astragalus* based on differences in keel-petals and legumes. Now the characters of the apiculation of keels and of the leaflets inequilateral at base are recognized as important for *Oxytropis* as its generic distinctness (Wheeler 1939, Barneby 1952). In molecular phylogenetic researches of Galegeae, Sanderson and Liston (1995) suggested that *Oxytropis* may be monophyletic by the analysis of internal transcribed spacer (ITS) regions of nuclear rDNA.

Bunge (1874) classified 181 species of *Oxytropis* into four subgenera and 19 sections. Based on his system, Vassilczenko and Fedtschenko (1948) divided the genus for the Flora of USSR into six subgenera and 21 sections containing 276 species. *Oxytropis* of China were summarized by Peter-Stibal (1837–1938) as two subgenera, 11 sections, and 27

species including one hybrid. Wang and Tang (1955) compiled illustration of 27 species and one variety. Succeedingly, many species have been recorded and described in China, mainly in northern and northwestern parts, especially Xizang (Tibet), Xinjiang, and Inner Mongolia (Nei Monggol). There seem to be more new species in China and, moreover, most of the known species need to be revised especially based on recent extensive collections from various regions in China.

While our studies on *Oxytropis* for Flora of China in English Edition, four new species of subgenus *Oxytropis* found in Xinjiang are described below.

1. *Oxytropis barkolensis* X.Y.Zhu, H.Ohashi & Y.B.Deng

The new species most resembles *Oxytropis grandiflora* (Pall.) DC., but differs as follows:

1. Stipules narrowly triangular; calyx-lobes equal to the tube (lobes 4–5 mm long, standard emarginate at apex; ovary almost glabrous *O. barkolensis*
1. Stipules broadly ovate, calyx-lobes much shorter than the tube (lobes 2.5–3 mm long,

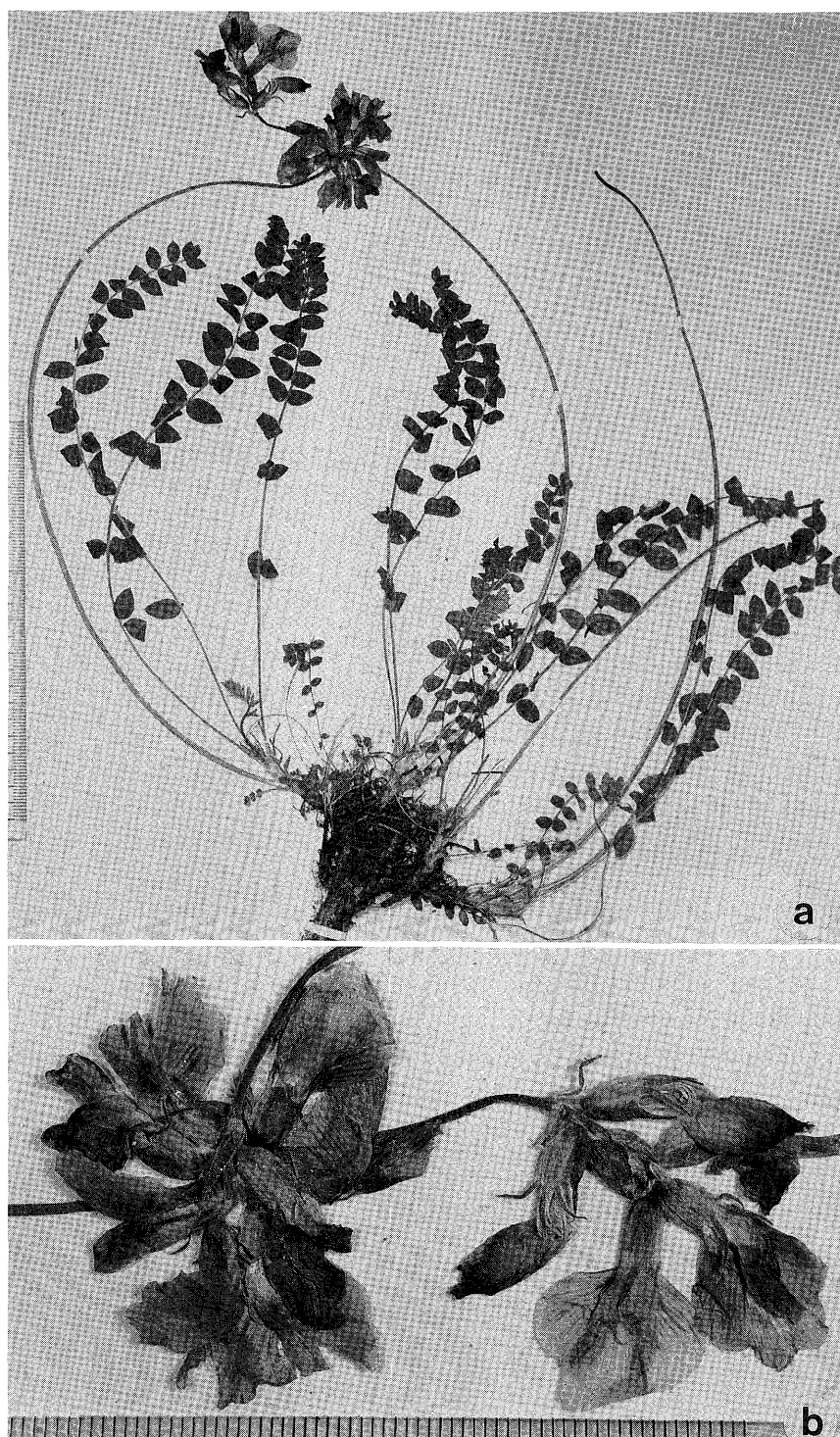


Fig. 1. a: Holotype of *Oxytropis barkolensis* X.Y.Zhu, H.Ohashi & Y.B.Deng. Xinjiang University Collection Team 87-01914 (PE). b: Inflorescences enlarged (Holotype).

tube 10–14 mm long); standard rotund at apex; ovary densely hairy.. *O. grandiflora* **Oxytropis barkolensis** X.Y.Zhu, H.Ohashi & Y.B.Deng, sp. nov. (Section Protoxytropis Bunge). (Figs. 1, 2-1).

Haec species ab *O. grandiflora*, stipulis anguste triangularibus, dentibus cum tubum aequalibus, 4–5 mm longis, ca. 0.5 mm latis, vexillo emarginato apice, ovario fere glabro differt.

Specimens examined: China. **Xinjiang**. Hami Co.: Barkol, Higou. Xinjiang University Collection Team 87-01914, 2 July 1987 (PE-**Holotypus**, TUS-**Isotypus**); loc. cit. XUCT 87-01237 (TUS).

Perennial herb; stems short, caespitose from a thick rootstock. Leaves subglabrous, 16–27 cm long; leaflets 13–17 pairs, ovate, 11–12 mm long, 4–5 mm wide; stipules narrowly triangular, villose, ca. 1.8 cm long, ca. 3 mm wide, connate at base. Racemes much longer than leaves, ca. 34 cm long; bracts triangular, 6–7 mm long, ca. 3 mm wide, pubescent. Calyx campanulate, 8–10 mm long, ca. 0.4 mm wide, with whitish and blackish hairs, 5-lobed, lobes subulate, 4–5 mm long, ca. 0.5 mm wide, as long as tube. Corolla purple (when dry); standard clawed, lamina

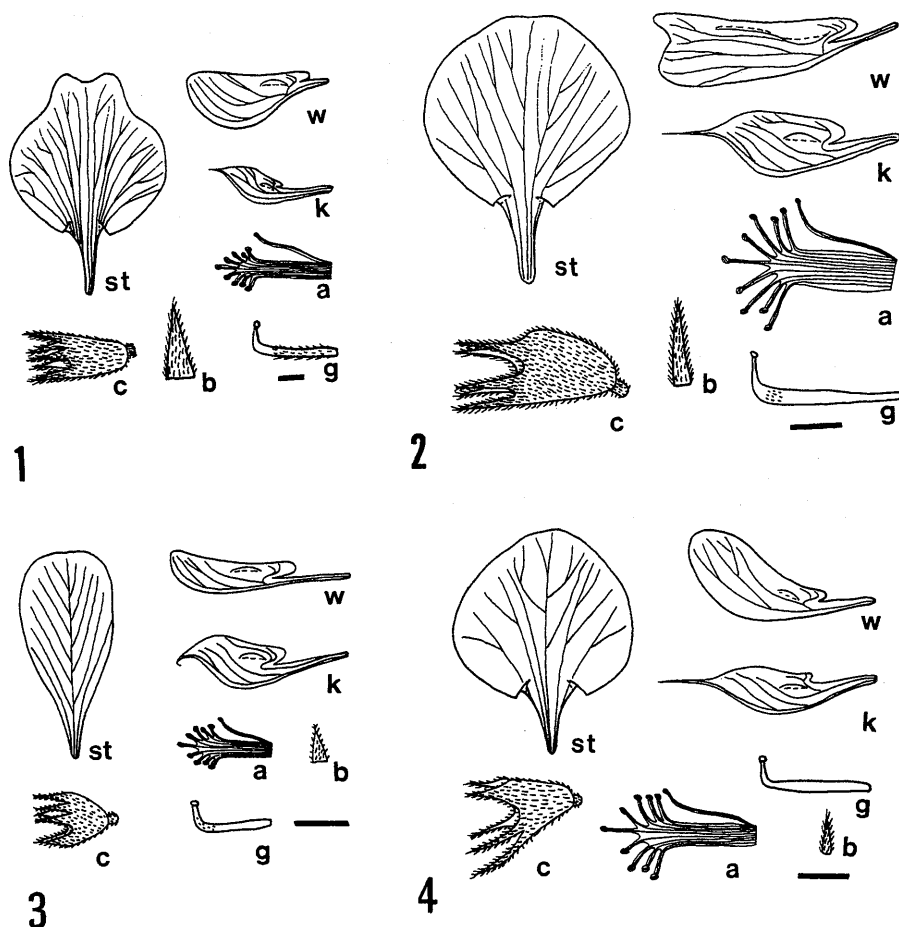


Fig. 2. Flowers of *Oxytropis barkolensis* (1), *Oxytropis qitaiensis* (2), *Oxytropis tukemansuensis* (3), and *Oxytropis yekenensis* (4). st: standard (from inside); w: wing (from inside); k: keel-petal (from outside); g: gynoecium; c: calyx (from outside); a: androecium (from outside); b: bract (from outside). Voucher specimens: all Holotype. Scale bar = 2.0 mm.

ovate, constricted at upper part, emarginate at apex, ca. 15 mm long, ca. 15 mm wide, claw 5–6 mm long, ca. 1.5 mm wide; wings short-clawed, lamina obovate, ca. 11 mm long, ca. 5.5 mm wide, auricles ca. 1.5 mm long, ca. 1 mm wide, claw ca. 2.5 mm long, ca. 0.5 mm wide; keel-petals clawed, lamina ovate, ca. 5 mm long, ca. 3 mm wide, auriculate at base, auricles ca. 0.5 mm long, ca. 0.5 mm wide, claw ca. 5 mm long, ca. 1 mm wide, beak 2–2.5 mm long. Androecia diadelphous, ca. 11 mm long. Ovary tube-like, subglabrous, ca. 7.5 mm long, ca. 1 mm wide, style ca. 2.5 mm long. Pods unknown. Flowering: June–July.

2. **Oxytropis qitaiensis** X.Y.Zhu, H.Ohashi & Y.B.Deng

This species resembles *Oxytropis caespitosula* Gontsch., but differs from it as in the following key:

1. Stem hardly developed; leaflets subglabrous above; inflorescences capitate or racemose with more or less lax flowers; wings emarginate at apex, beak of keel 1.5–2 mm long *O. qitaiensis*
1. Stem elongate; leaflets with appressed hairs; inflorescences globose; wings rotund at apex, beak of keel ca. 1 mm long
..... *O. caespitosula*

Oxytropis qitaiensis X.Y.Zhu, H.Ohashi & Y.B.Deng, sp. nov. (Section Eumorpha Bunge). (Figs. 2-2, 3).

Haec species ab *O. caespitosula* caulibus nullo, foliolis supra subglabris, inflorescentiis capitatis vel leviter laxifloribus, alis emarginatis ad apicem, rostro carinae 1.5–2 mm longo, leguminibus ca. 18 mm longis, ca. 4.5 mm latis differt.

Typus: China. Xinjiang, Qitai Xian. Xinjiang University Collection Team s.n., 28 June 1982 (PE-Holotypus & Isotypus, TUS-Isotypus).

Acaulescent perennial herb, 17–40 cm tall. Leaves 9–25 cm long, rhachides and petioles

subglabrous or with sparse appressed hairs; leaflets 9–17 pairs, narrowly ovate or ovate, 18.6–28 mm long, 4.2–10 mm wide, subglabrous above, sometimes with dense glandular hairs beneath, apex cuspidate; stipules hard coriaceous, narrowly triangular, 8–10 mm long, 2–3 mm wide, with dense appressed hairs, connate at base. Inflorescences capitate or more or less lax racemose, with many flowers, 17–40 cm long, longer than leaves; bracts narrowly triangular, 2.5–4 mm long, ca. 0.6 mm wide, with hairs. Calyx campanulate, 5.3–6.5 mm long, with whitish or blackish hairs, sometimes with glandular hairs, 5-lobed, lobes subequal, linear-triangular, 2.3–3.5 mm long, 0.2–0.3 mm wide, as long as tube. Corolla violet (when dry); standard clawed at base, lamina orbicular, 6–8 mm long, 6–8 mm wide, claw 3–4 mm long, ca. 1.2 mm wide; wings clawed, lamina narrowly obovate, ca. 7 mm long, ca. 3 mm wide, claw ca. 2.5 mm long, ca. 0.4 mm wide, emarginate at apex, auriculate at base, auricle ca. 1 mm long, 0.4 mm wide; keel-petals clawed, lamina obovate, ca. 4 mm long, ca. 2.5 mm wide, claw ca. 2 mm long, ca. 0.4 mm wide, slightly auriculate at base, auricle ca. 0.4 mm long, ca. 0.6 mm wide, beak 1.5–2 mm long. Androecia diadelphous, ca. 6.5 mm long. Ovary tube-like, subglabrous or sometimes with hairs, ca. 4 mm long, ca. 0.5 mm wide, stipe ca. 2 mm long, style incurved, ca. 1 mm long. Pods cylindric, appressed short pubescent, ca. 18 mm long, ca. 4.5 mm wide. Fl. & fr.: June–July.

Other specimens examined: China. Xinjiang, Qitai Xian. Xinjiang University Collection Team (=XUCT) s.n., 31 June 1982 (TUS), XUCT 9513013 (TUS), XUCT s.n., 28 June 1978 (TUS), XUCT s.n., 27 June 1982 (TUS).

3. **Oxytropis tukemansuensis** X.Y.Zhu, H.Ohashi & Y.B.Deng

This new species is similar to *Oxytropis microsphaera* Bunge, but distinguished as follows:

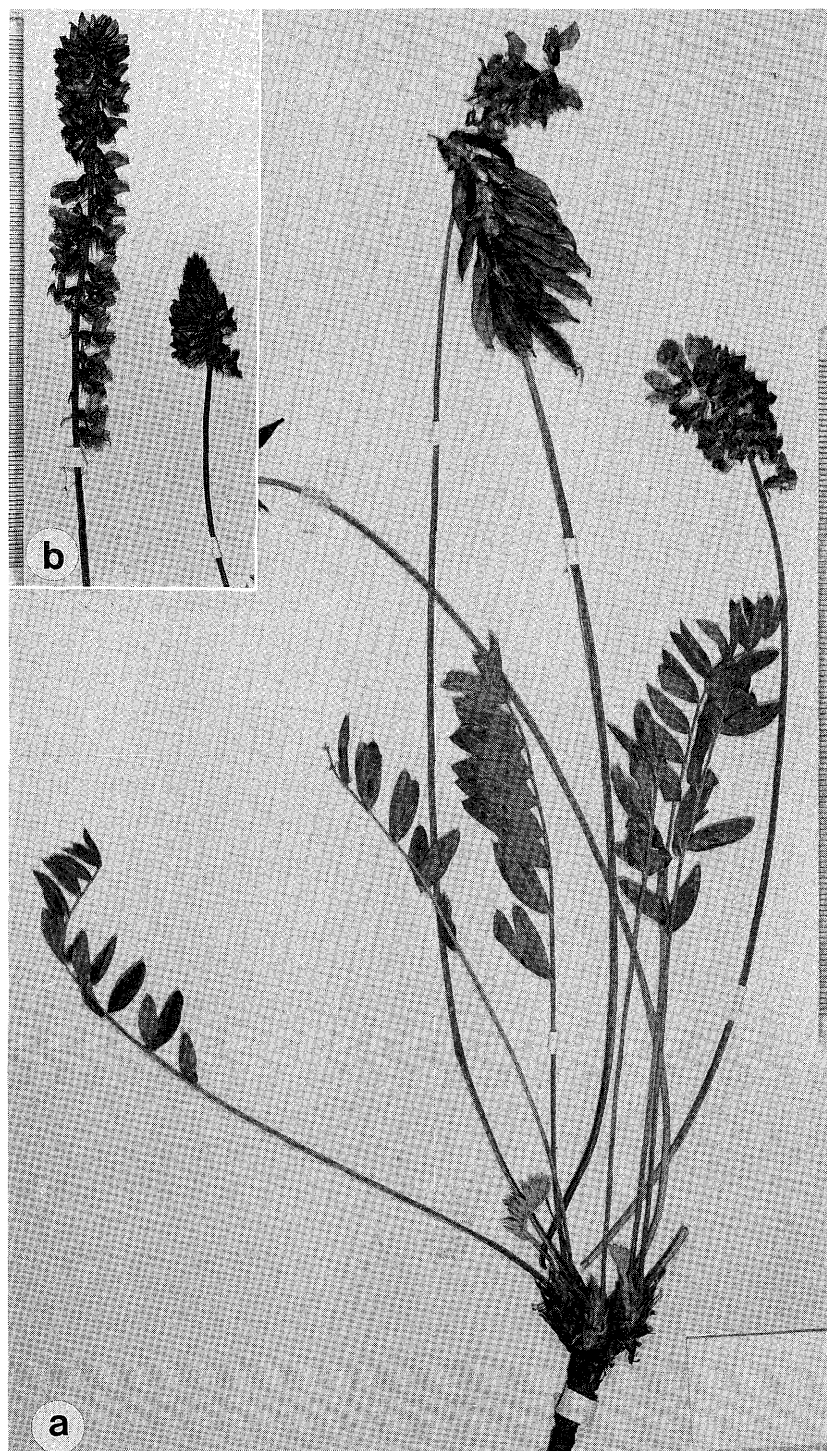


Fig. 3. a. Holotype of *Oxytropis qitaiensis* X.Y. Zhu, H. Ohashi & Y.B. Deng. Xinjiang University Collection Team s.n. (PE). b. Inflorescences showing variation and development in length. Voucher: Xinjiang University Collection Team s.n., June 28, 1978 (TUS).

1. Plants 3.5–4.5 cm tall, with yellowish brown hairs; racemes with 5–7 flowers; flowers red, keel-beak ca. 1 mm long

..... *O. tukemansuensis*

1. Plants 5–10 cm tall, with grayish hairs, racemes with many flowers; flowers purple, keel-beak ca. 0.2 mm long

..... *O. microsphaera*

Oxytropis tukemansuensis X.Y.Zhu, H.Ohashi & Y.B.Deng, sp. nov. (Section *Ianthina* Bunge). (Figs. 2-3, 4).

Haec species ab *O. microsphaera* plantis brevioribus 3–4.5 cm altis, fulvo-pubescentibus, floribus rubris, racemis paucifloribus 5–7 floribus, rostro carinae ca. 1 mm longo differt.

Typus: China. Xinjiang. Taxkorgan, Tukemansu, alt. 4200 m. Xinjiang University Collection Team 1299, July 10, 1978 (PE-Holotypus; TUS-Isotypus).

Acaulescent, perennial herb, 3.5–4.5 cm tall, yellowish brown pubescent. Stems copiously branched and caespitose from a thick woody rootstock. Leaves 1–2 cm long, with yellowish brown or glandular hairs; stipules ovate, ca. 5 mm long, ca. 2 mm wide, connate at base. Leaflets 5–8 pairs, linear or ovate, 3–4 mm long, 1–1.5 mm wide. Racemes ca. 4 cm long, longer than leaves, with 5–7 flowers; bracts triangular, with yellowish brown hairs. Calyx campanulate, ca. 3 mm long, ca. 2 mm wide, 5-lobed, lobes narrowly triangular, ca. 1.6 mm long, ca. 0.4 mm wide, tube ca. 1.4 mm long. Corolla red; standard obovate, 7–8 mm long, ca. 3.6 mm wide, gradually narrow to claw; wings long-clawed, lamina obovate, ca. 4 mm long, ca. 1.2 mm long, auriculate, claw ca. 3 mm long, ca. 0.3 mm wide; keel-petals long-clawed, lamina ovate, ca. 3 mm long, ca. 2 mm wide, auriculate, claw ca. 2.7 mm long, ca. 0.4 mm wide, beak ca. 1 mm long at the top of keel-petals. Stamens ca. 3.5 mm long. Ovary subglabrous, ca. 2.5 mm long, ca. 0.4 mm wide, style ca. 0.8 mm long. Pods fusiform, 9–

10 mm long, 2.5–3 mm wide, with whitish hairs. Fl. & fr.: June–July.

4. **Oxytropis yekenensis** X.Y.Zhu, H.Ohashi & Y.B.Deng

The new species is similar to *Oxytropis deflexa* (Pall.) DC., but distinguished from it as in the following key:

1. Plants 15–25 cm tall; leaflets linear or narrowly ovate, petiolulate (petiolule ca. 0.5 mm long); flowers lax, pedicellate; calyx 4–4.5 mm long; beak of keel ca. 1.5 mm long

1. Plants 2–12 cm tall; leaflets ovate, sessile; flowers dense, sessile; calyx 6–7 mm long; beak of keel ca. 1 mm long

..... *O. deflexa*
Oxytropis yekenensis X.Y.Zhu, H.Ohashi & Y.B.Deng, sp. nov. (Section *Mesogaea* Bunge). (Figs. 2-4, 5).

Species haec ab *O. deflexa*, plantis 15–25 cm altis, foliolis laxis, linearibus vel anguste ovatis, petiolulatis (petiolulis ca. 0.5 mm longis), racemis laxi-floribus, calyce ca. 4–4.5 mm longo, ca. 2 mm lato, pedicellis ca. 1 mm longis, rostro carinae ca. 1.5 mm longo differt.

Habit: China. Xinjiang, Altay: Yeken, Bulake. Xinjiang University Collection Team s.n., 26 May 1963 (PE-Holotypus); loc. cit. XUCT s.n., 24 May 1963 (TUS).

Erect perennial herb; stems caespitose from a thick rootstock, 15–25 cm tall, more or less whitish pubescent. Leaves 7–9 cm long; leaflets lax, 7–9 pairs, petiolulate (petiolules ca. 0.5 mm long), linear or narrowly ovate, 8–13 mm long, ca. 1 mm wide; stipules subulate, 3–3.5 mm long, ca. 0.8 mm wide, separate or sometimes connate at base, with appressed hairs. Racemes with many lax flowers, 7–19 cm long, much longer than leaves; bracts linear-triangular, ca. 1.5 mm long, ca. 0.2 mm wide, with whitish hairs. Calyx campanulate, 4–4.5 mm long, ca. 2 mm wide, with whitish hairs, 5-lobed, lobes subulate, 1.2–2 mm long, ca. 0.2 mm wide, tube ca. 2.5 mm long. Corolla

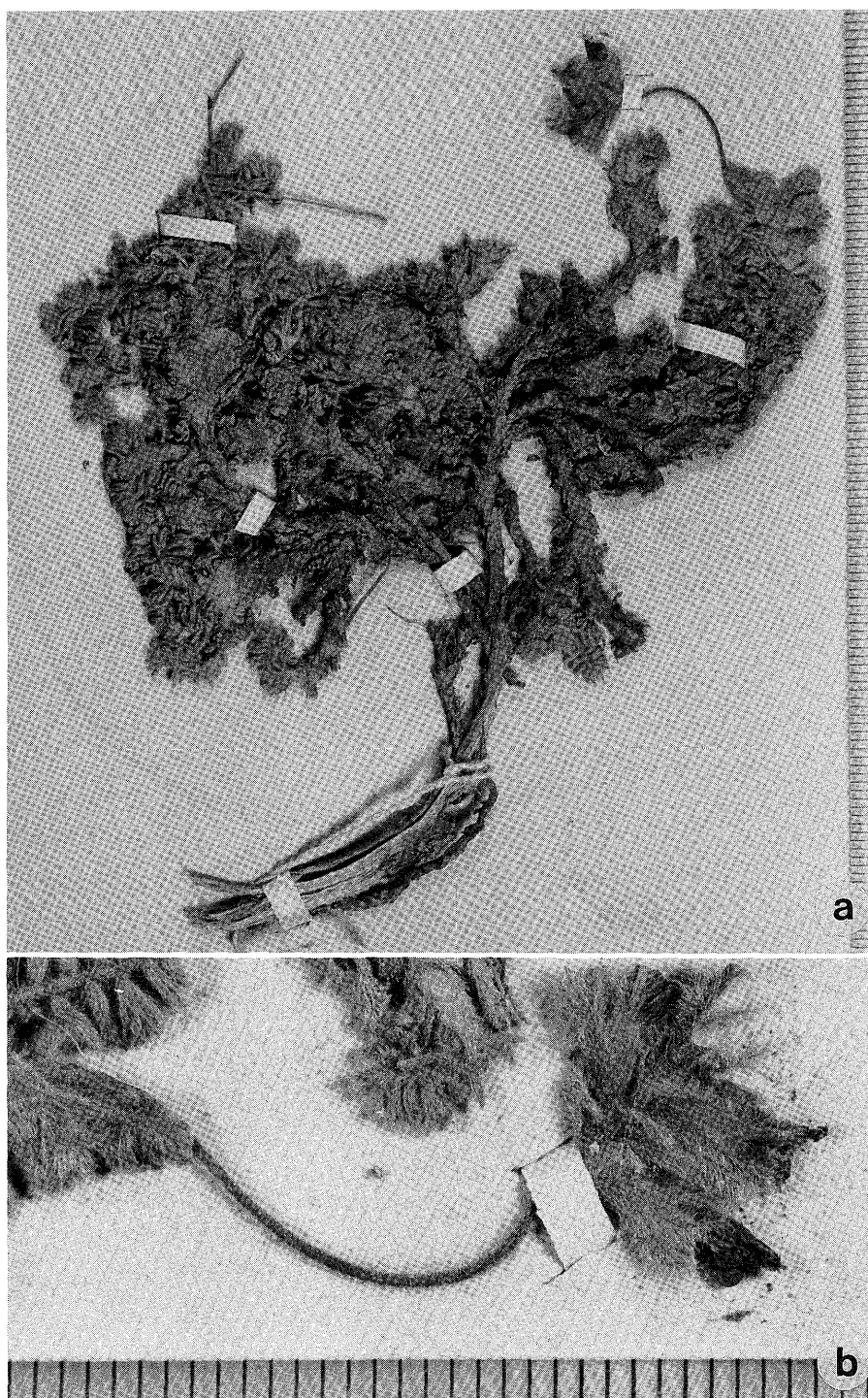


Fig. 4. Holotype of *Oxytropis tukemansuensis* X.Y.Zhu, H.Ohashi & Y.B.Deng.



Fig. 5. Holotype of *Oxytropis yekenensis* X.Y.Zhu, H.Ohashi & Y.B.Deng.

purple; standard 8–8.5 mm long, lamina broadly ovate, 6–6.5 mm long, 5–5.5 mm wide, tapering to a claw at base, claw ca. 2 mm long, ca. 1.4 mm wide; wings clawed, lamina oblong incurved, ca. 5.5 mm long, ca. 2.5 mm wide, claw ca. 2 mm long, ca. 0.4 mm wide, auriculate at base, auricle ca. 0.4 mm long, ca. 0.6 mm wide; keel-petals clawed, lamina narrowly elliptic, ca. 3.5 mm long, ca. 2 mm wide, claw ca. 2.5 mm long, ca. 0.8 mm wide, with the very short auricle at base, beak ca. 1.5 mm long. Stamens ca. 5.5 mm long. Ovary tube-like, subglabrous or glabrous, ca. 4 mm long, ca. 0.6 mm wide, style incurved, ca. 1 mm long. Pods (immature) hairy. Fl. & fr.: May.

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朱 相雲^a, 大橋広好^a, 鄧 彦斌^b: 中国新疆自治区産オヤマノエンドウ属 (マメ科) の4新種

オヤマノエンドウ属は北半球の亜寒帯と寒帯に約300種が生育する (Polhill 1981). 中国からは中国主要植物図説豆科 (1955) で27種1変種が記録されており, その後も各地から数多くの新種が加えられてきている. しかし, 全体をまとめた成果は発表されておらず, 中国のオヤマノエンドウ属

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の全体像は不明のままであり, 目下研究中である. この論文ではその過程で発見した中国新疆自治区からの4新種を発表した.

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